



## **The New version of Danish food composition database FRIDA including a case study on recipe calculation compared to a chemical analysis**

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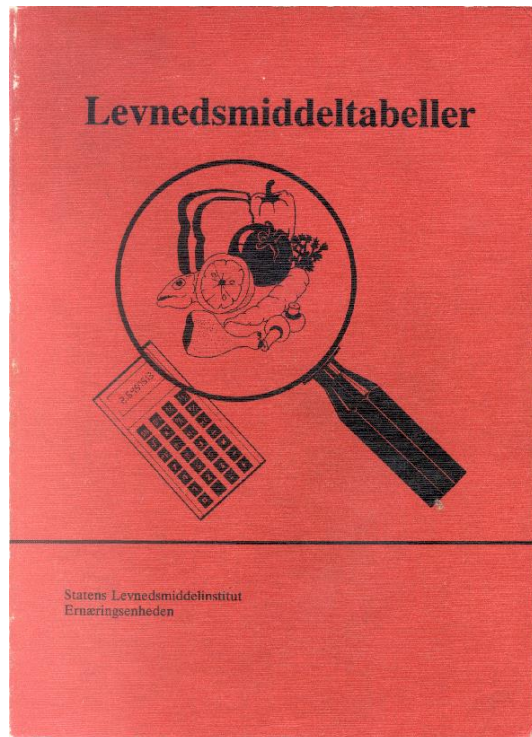
# **New version of the Danish food composition databank FRIDA**

Including a case study on recipe calculation compared to chemical analysis.

Tue Christensen and Anja Biltoft-Jensen

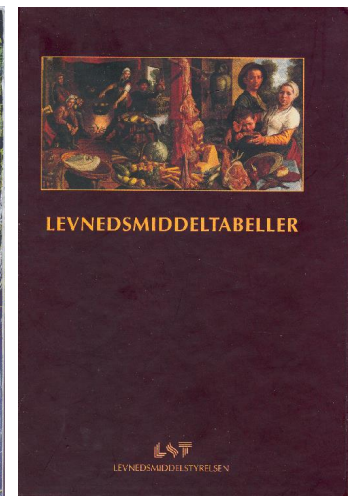
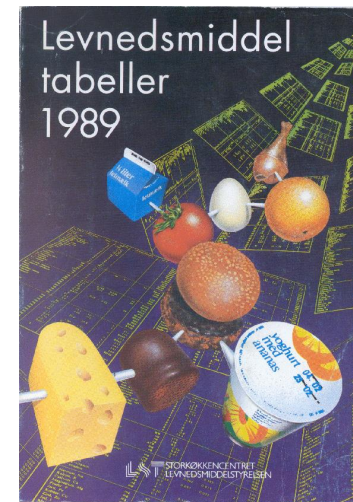
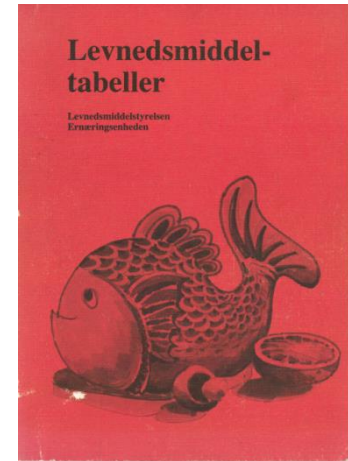
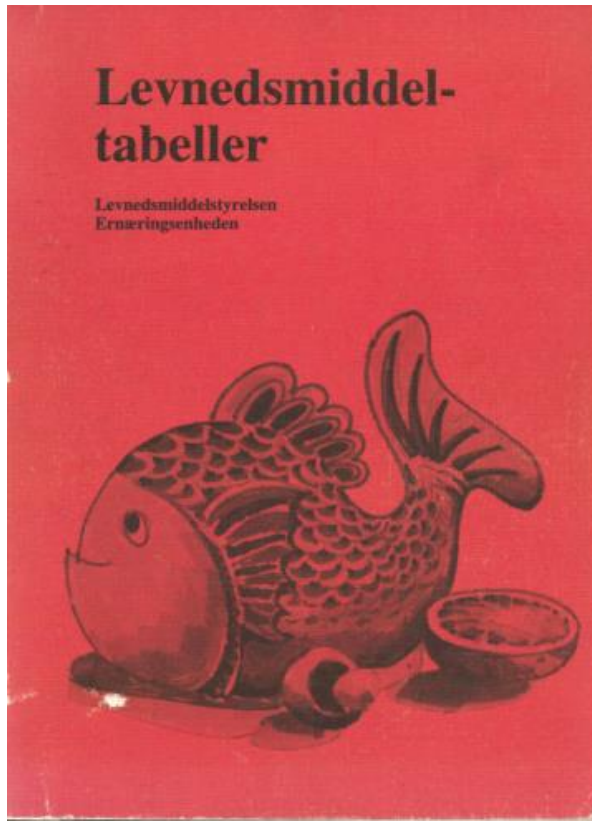
# The beginning

- Denmark is in need of official tables, as National Dietary Survey is being planned.
- In 1981 The Danish Meat Trade College in Roskilde and the National Food Institute initiates project on food data bank.
- 1983 the first printed version is published



# The sequels

- Printed tables are published in the 80' and 90'
- 1985 version 2
- 1989 version 3
- 1996 version 4



# WWW.foodcomp.dk

- 2002 our first release on the internet

Fødevaredirektoratet Ministeriet for Fødevarer, Landbrug og Fiskeri

Fødevaredatabanken

> Fødevaredatabanken

- Søg fødevaredata
- Om fødevaredata
- Brug af fødevaredata
- Hent fødevaredata

- Norfoods 2000

- LanguaL

- Andre netsteder

Food Composition

FVDB nr. 0001

**Abrikos, tørret**


Apricot, dried

*Prunus armeniaca* L.

Indhold pr. 100 g	Enhed	Indhold	Variationsbredde	Antal	Kilde
Energi	kJ	1244			00050
Protein, total	g	2.9	2.6 - 3.5	4	05165
total-N	g	0.464	0.416 - 0.560	4	05165
Fedt, total	g	1.7	1.5 - 1.9	2	05165
mættede fedtsyrer	g	0.14			00050
monoumætt. fedtsyrer	g	0.84			00050
polyumætt. fedtsyrer	g	0.38			00050
Kulhydrat, total	g	66.5	62.9 - 68.8	4	05165
Tilsat sukker	g	0			00000
Kostfibre	g	9.30	7.1 - 13.8	4	05165
Alkohol	g	0			00000
Aske	g	2.8	1.7 - 3.5	4	05165
Vand	g	28.6	16.7 - 41.7	8	S0001
A-vitamin	RE	398			00050
Retinol	µg	0			00802
β-caroten	µg	2390	1270 - 4540	4	05148
D-vitamin	µg	0			00802
D3 cholecalciferol	µg				
D2 ergocalciferol	µg				
25-hydroxycholecalciferol	µg				
E-vitamin	αTE	4.00			00050
alfa-tokoferol	mg	4.00	3.04 - 4.95	2	00128
K1-vitamin	µg				
B1-vitamin, thiamin	mg	0	<0.003	3	00113
B2-vitamin, riboflavin	mg	0.060	0.058 - 0.065	2	00116
Niacin	NE	3.03			00050
niacin	mg	2.8	2.50 - 3.20	10	00112
tryptofans bidrag	mg	0.30			00050
B6-vitamin	mg	0.170			00802
Pantothensyre	mg	0.70			00802
Biotin	µg	1.00			00050
Folacin	µg	14			00802
B12-vitamin	µg	0			00802
C-vitamin	mg	2.4			00050
L-ascorbinsyre	mg	2.4		3	00800

# WWW.foodcomp.dk

- 2005 our second release on the internet

Danmarks Tekniske Universitet 

**Fødevareinstituttet**

**Fødevaredatabanken - version 6.02**

FVDB nr. 0002

**Agurk, rå**  
Cucumber, raw  
*Cucumis sativus* L.

Svind: 5%

Indhold pr. 100 g	Enhed	Indhold	Variation	Antal	Kilde
Energi	kJ	45			00050
Protein, total	g	0.7	0.5 - 0.9	26	S0003
total-N	g	0.115	0.086 - 0.150	26	S0004
Fedt, total	g	0.1		4	S0005
mættede fedtsyrer	g	0.033			00050
monumætt. fedtsyrer	g	0.003			00050
polyumætt. fedtsyrer	g	0.044			00050
Kulhydrat, total	g	2.1	1.00 - 3.33	16	S0007
kulhydrat, tilgængelig	g	1.35			00050
tilsat sukker	g	0			00000
kostfibre	g	0.75	0.53 - 1.08	38	S0008
Alkohol	g	0			00000
Aske	g	0.4	0.3 - 0.55	26	S0009
Vand	g	96.4	95.11 - 97.860	38	S0010
A-vitamin	RE	5			00050
Retinol	µg	0			00802
β-caroten	µg	62	23 - 92	4	05148
D3-cholecalciferol	µg	0			00802
D2-ergocalciferol	µg				
25-hydroxycholecalciferol	µg				
E-vitamin	α-TE	0.15			00050
α-tokiferol	mg	0.15	0.10 - 0.22	7	00128
K-vitamin	µg	0	<5		00909
B1-vitamin, thiamin	mg	0.017	0.002 - 0.026	39	S0011
B2-vitamin, riboflavin	mg	0.017	0.012 - 0.027	27	S0012
Niacin	NE	0.28			00050
niacin	mg	0.2	0.12 - 0.21	10	00112
tryptofans bidrag	mg	0.08			00050
B6-vitamin	mg	0.034	0.015 - 0.051	38	S0013
Pantothensyre	mg	0.30			00802
Biotin	µg	0.40			00802
Folat	µg	18	9.9 - 26	27	S0014
B12-vitamin	µg	0			00802
C-vitamin	mg	13.7			00050
L-ascorbinsyre	mg	9.7	3.3 - 14.9	38	S0015
L-dehydroascorbins.	mg	4.0			05177
Natrium, Na	mg	10	4.7 - 20.0	6	00152
Kalium, K	mg	136	84 - 202	27	S0016
Calcium, Ca	mg	21	11 - 35	12	S0017
Magnesium, Mg	mg	9	6.22 - 13.0	27	S0018
Phosphor, P	mg	25	16.8 - 35.0	6	00109

# WWW.foodcomp.dk

- 2009 third release of foodcomp.dk

Google Developers

Mobile Guide Get Started Documentation ▾ Mobile-Friendly Test

## Mobile-Friendly Test G+

<http://www.foodcomp.dk/v7/> ANALYZE

**Not mobile-friendly**

### Page appears not mobile-friendly

- ✗ Text too small to read
- ✗ Links too close together
- ✗ Mobile viewport not set

For details on which parts of the page are affected by these usability issues, see [Pagespeed Insights](#).

### How Googlebot sees this page

### Make this page mobile-friendly

Pick the option that describes how you created this site:

**I used a CMS**  
I used software such as WordPress or Joomla.  
Next

**Someone built this site for me**  
I hired someone to build this site and want advice for working with a developer.  
Next

**I built this site myself**  
I built this site myself and understand how to code.  
Next

**Do you use Google Search Console?**  
See how many of your pages are mobile-friendly by signing into your [Search Console account](#).

# frida.fooddata.dk

- 2015
  - New layout
  - New data

The screenshot shows the Google Developers Mobile-Friendly Test interface. At the top, the Google Developers logo is on the left, and navigation links for 'Mobile Guide', 'Get Started', 'Documentation', and 'Mobile-Friendly Test' are on the right. The main heading is 'Mobile-Friendly Test' with a '+1' button. Below this is a text input field containing 'http://frida.fooddata.dk/' and an 'ANALYZE' button. A green banner below the input field states 'Awesome! This page is mobile-friendly.' The page is divided into three columns. The left column, titled 'How Googlebot sees this page', features a smartphone mockup displaying the mobile version of the 'frida.fooddata.dk' website. The middle column, titled 'Learn more about mobile-friendly pages', contains text about learning more about mobile sites and links to 'Webmaster's Mobile Guide' and 'Principles of Site Design'. The right column, titled 'Do you use Google Search Console?', provides information on how many pages are mobile-friendly and links to a 'Search Console account'. At the bottom of the right column is a 'Give feedback' section with text about reporting issues and a link to a 'discussion group'.

Google Developers

Mobile Guide Get Started Documentation Mobile-Friendly Test

Mobile-Friendly Test G+1

ANALYZE

**Awesome! This page is mobile-friendly.**

**How Googlebot sees this page**

**Learn more about mobile-friendly pages**

If you're interested in learning more about mobile sites, check out our [Webmaster's Mobile Guide](#) or the [Principles of Site Design](#) on Web Fundamentals.

**Do you use Google Search Console?**

See how many of your pages are mobile-friendly by signing into your [Search Console account](#).

**Give feedback**

Encountered an issue with the test? Comments or questions about the results? Post to our [discussion group](#).



# Frida.fooddata.dk

Main site  
(food composition data)

DTU Fødevareinstituttet

**FOODDATA**  
2015-12-04

Seek food:

food

**FOOD LISTS**

Alphabetic

By food group

By content

**FOODDATA+**

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**WELCOME!**

Choose Language [en]

da 

en 

Nr. 388 **Agurk, rå**

English name: Cucumber, raw

Taxonomic name: Cucumis sativus L.

Synonyms: Agurker.

Proximates	Cont. /100g	Unit	Median	Variation	Count	Source
Energy, kJ	50	kJ				1003
Energy, kcal	12					1003
total N	0.114	g		0.085-0.150	38	1068, 1825, 1842, 1859
Protein, total	0.7	g		0.531-0.938	38	1068, 1825, 1842, 1859
Protein labeling	0.7	g				1003
Carbohydrate by difference	2.4	g				1003
Carbohydrates, available	1.6	g				1003
Carbohydrate, declaration	1.6	g				1003
Added sugar	0.0	g				1655
Dietary fiber	0.7	g		0.53-1.08	38	1305, 1842, 1859
Fat, total	0.1	g		0.1-0.1	4	1068, 1825
Alcohol	0.0	g				1655
Ash	0.4	g		0.3-0.55	26	1825, 1842, 1859
Dry matter	3.6	g		2.140-4.89	58	1068, 1305, 1808, 1825, 1842, 1859
Water	96.4	g		95.110-97.860	58	1068, 1305, 1808, 1825, 1842, 1859

Factors	Value	Count	Source
Waste	6	9	1015
Protein Conversion Factor (NCF)	6.25		
Fatty acid conversion factor (FCF)	0.800		

Vitamins	Cont. /100g	Unit	Median	Variation	Count	Source
Vitamin A	5.17	RE				1003
Retinol	0	µg				1344
beta-carotene	62.0	µg	66.0	23-92	4	1808
Vitamin D	0	µg				1003
D3 cholecalciferol	0	µg				1344
Vitamin E	0.150	α-TE				1003
alpha-tocopherol	0.150	mg		0.10-0.22	7	1034
Vitamin K1	16.4	µg			4	1928

Sub site  
(Documentation and membersite)

DTU Fødevareinstituttet

**Fooddata+**

English support for Danish Fooddata

You are here: Fooddata

**Fooddata**

Welcome to Fooddata+.

These pages gives you

- Documentation for Fooddata
- User registration
- Data download

[See food data](#)

Fooddata

Fooddata Documentation

Download data

Corrections

Disclaimer

Cookies

Mobil Login

Historic data

Username

Password

☐ Remember User

Register

Print view

Sitemap

Last update: January 18, 2016, 16:35



# More transparency

DTU Fødevareinstituttet

FOODDATA

2015-12-04

Seek food:

FOOD LISTS

Alphabetic

By food group

By content

FOODDATA+

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WELCOME!

Choose Language [en]

da 

en 

Source

8:Fedtsyrer

37048

Fedtsyrer ved GC

AF2711 ikke færdig (modtaget)

# Case study - recipe calculation compared to chemical analysis of fast foods.

## Recipe calculation in GIES

GIES m.u. - [Recipe]

File Edit Window Calculate Recipe Help

Recipe Memo Food Items Bill of materials As Ingredients Content

Name	Code	Barcode	Created	Edtdate	Unit	Source	Svind v
Bearnaisesovs			5/19/2014				
Bechamelsovs			5/19/2014				

Ingredient

Ingredient	Net amount	Unit	Preparation	Number of ...
Agurk, syltet	8	1		
Cheddar, 50+	8	1		
Hakkebof	63	1		
Hvedebrød, bolle, fin, industrifremstillet	82	1		
LDC, rå	10	1		
Mayonnaise, dressing	25	1		
Salat, Iceberg	12	1		

GIES m.u. - [Recipe]

File Edit Window Calculate Recipe Help

Recipe Memo Food Items Bill of materials As Ingredients Content

Component	Content	Component#
Alusaltet	134.149	1
Protein, total	21.833	2
Fedt, total	110.661	3
matteede fedtsyrer	38.426	4
monumatteede fedtsyrer	46.126	5
polymatteede fedtsyrer	21.991	6
Kulhydrat best. v/diff.	241.835	7
Kulhydrat, total	241.835	8
Tilset sukker	5.769	9
Kost fibre	13.056	10
Alkohol		11
Aske	18.388	12
Vand	498.521	13
A-vitamin	169.795	14
Retinol	156.712	15
beta-caroten	156.977	16
D-vitamin	2.614	23
D3 cholecalciferol	.121	24
E-vitamin	7.255	26
alfa-tokopherol	5.342	27
alfa-tokotrienol		31
K1-vitamin	64.615	35
Thiamin, B1-vitamin	.844	36
Riboflavin, B2-vitamin	1.05	37
Niacin	43.964	38
niacin	30.802	39

Recipe Big Mac

Project K055 af juni 2015 (i) Koss ultimo juni



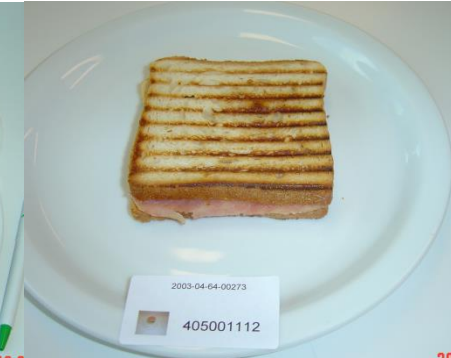
# Objective and rationale

- This study looks at the biases in nutrient estimation introduced by recipe calculation by comparing the content of selected nutrients estimated by recipe calculation and chemical analysis of fast foods ([www.frida.fooddata.dk](http://www.frida.fooddata.dk)).
- Some fast foods are composite foods (often needs a recipe for calculation)
- Selected nutrients
  - Energy** – nutrients come with energy
  - Protein** – protein rich foods such as meat
  - Saturated fat** – critical fat (90% get above 10 E%)
  - Iron** – critical mineral (53% women 18-50 y below AR)
  - Thiamin** – B-vitamin (24% below Average Requirement)
  - Potassium** – fruit, vegetables and potatoes
  - Sodium** – critical mineral (most get to much)

# Methods

- 135 samples of ready to eat fast foods as burgers, sandwiches, toasts, pitas, hot dogs and sausage mix (in total 7 types) collected from outlets (as sold over the counter) all over Denmark.
- They were separated into their recipe components as bread/buns, French fries, lettuce, meat, cheese, dressings etc. Each component were then weighed.
- The 135 items of fast foods were then chemical analyzed (as one food) for nutrient content.
- The content of nutrients were compared to recipe calculation performed using the weight, component description and photos taken of the fast foods.
- Wilcoxon Signed Rank test, Spearman correlation and Bland Altman plots were used to compare the recipe calculation of nutrient content to chemical analysis.

# Examples of fast foods



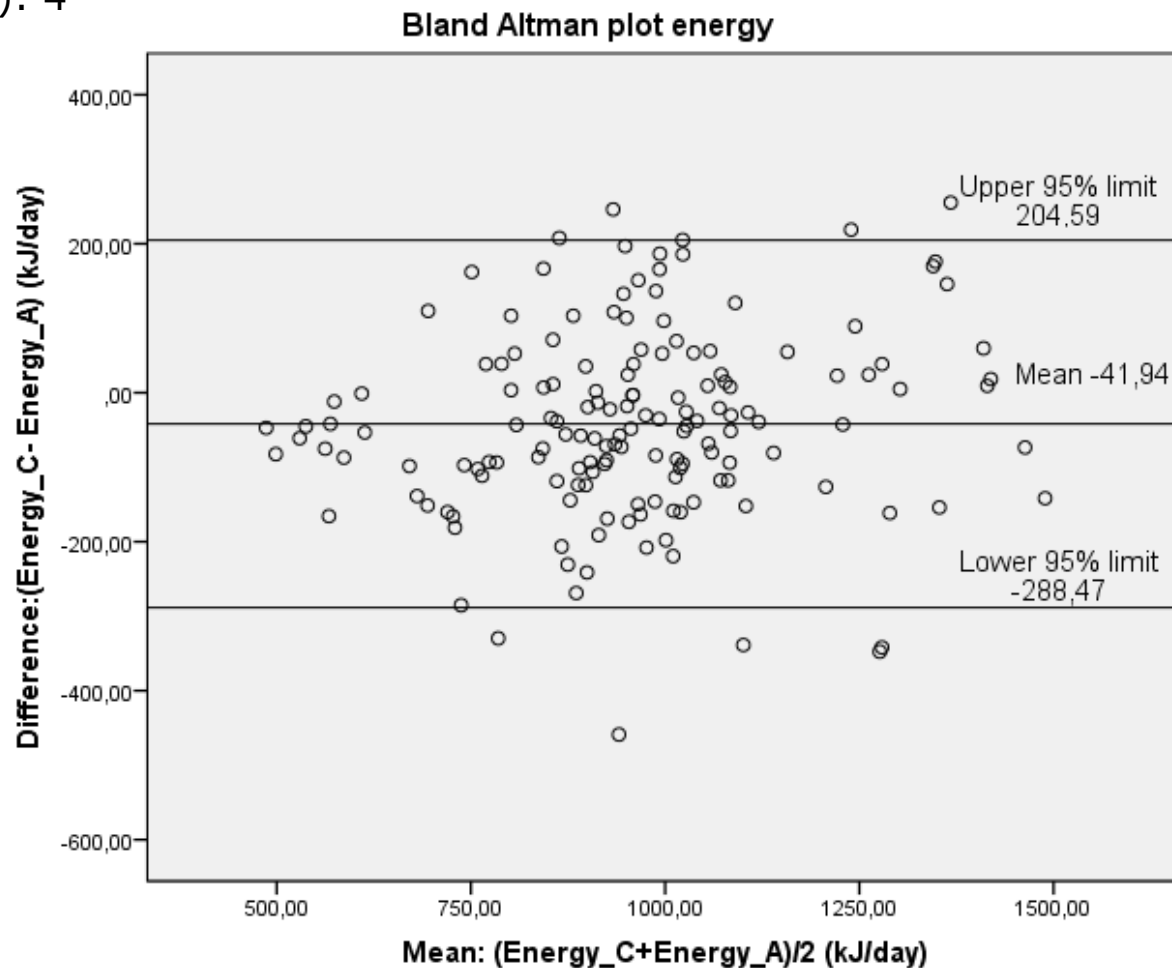
12 May 2016

# Results

	Difference	Difference (%)	P-value	Correlation
Energy (kJ/100g)	-42	-4	<0.01	0,75**
Protein (g/100g)	-1	-10	<0.01	0,68**
Saturated fat (g/100g)	1	28	<0.01	0,74**
Thiamin (mg/100g)	-0,01	-8	0.07	0,70**
Potassium (mg/100g)	3	1	0.87	0,71**
Iron (mg/100g)	0,1	9	<0.01	0,49**
Sodium (mg/100g)	-3	-0,6	0.21	0,66**

# Results: Energy

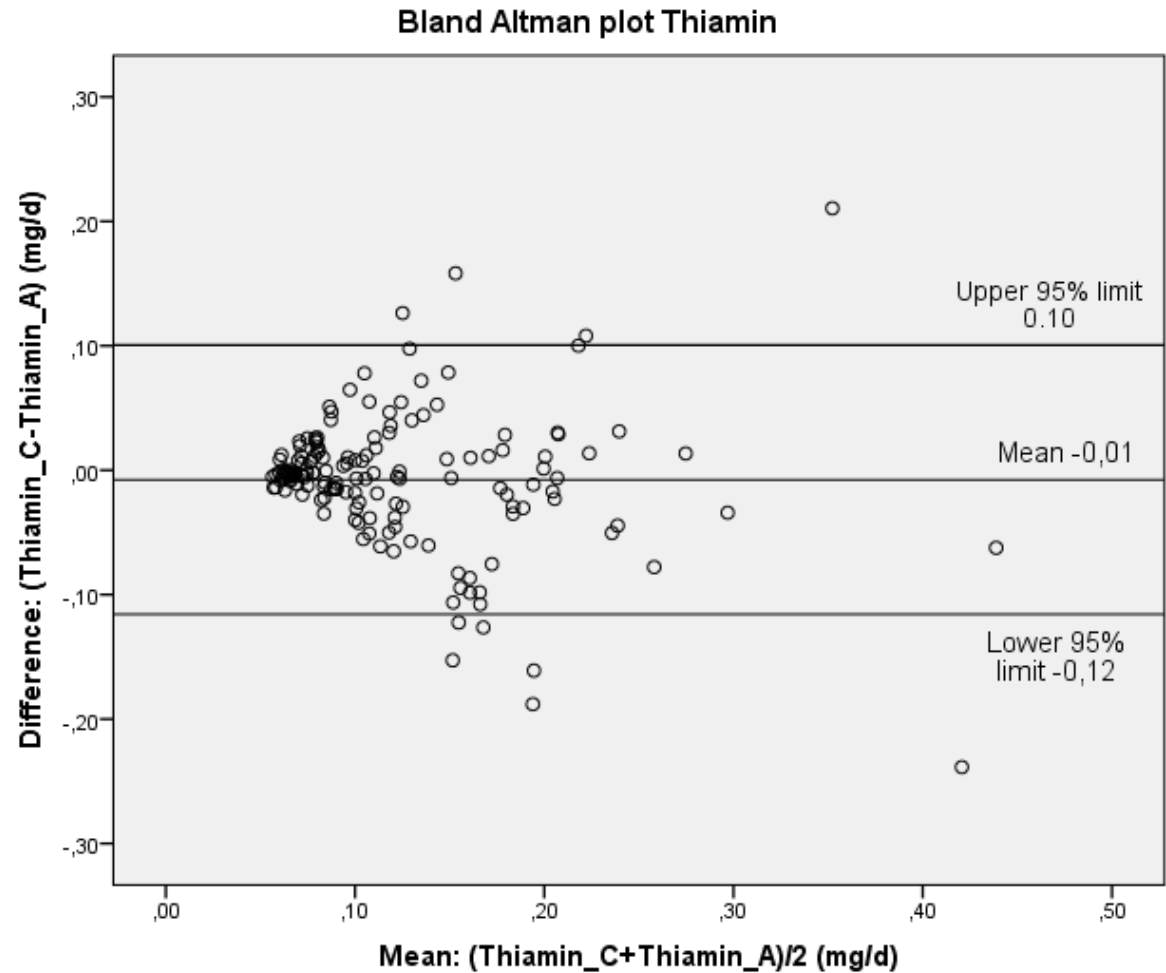
- P: <0.001
- Correlation: 0.75
- Difference (%): 4





# Results: Thiamin – proportional bias

- P: <0.07
- Correlation: 0.7
- Difference (%): 8



# Results depended on type of fast food

- For burgers (n=36) there was no significant difference between any nutrients (more uniform product).
- For the rest there was a significant difference for 2-3 nutrients except for sausage mix which had significant and large differences (up to 45% for saturated fat) for 5 out of 7 nutrients except for energy and potassium.



# Discussion and conclusion

- Weakness: Difficult to weigh the amount of dressing accurately. Do not have the actual recipe of ingredients. Have not analyzed individual components.
- Strengths: Get around the uncertainties of yield and retention factors by using components instead of recipe. The composite product is as the customer buy and eat it.
- For some processed and manufactured foods, means are not representative of values for certain brands. In our case foods on the catering market may vary from foods bought in stores. Furthermore, foods, may have been reformulated, since last analysis (in this case frying oil).
- Important both for nutrient intake evaluation and for small companies in order to provide the nutrient information required on the label.
- Shows the importance of having up to date and representative nutrient values.
- Inclusion of more varieties and better coverage of foods used as ingredients/components in composite foods.